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## GEOGRAPHICAL NOTES.

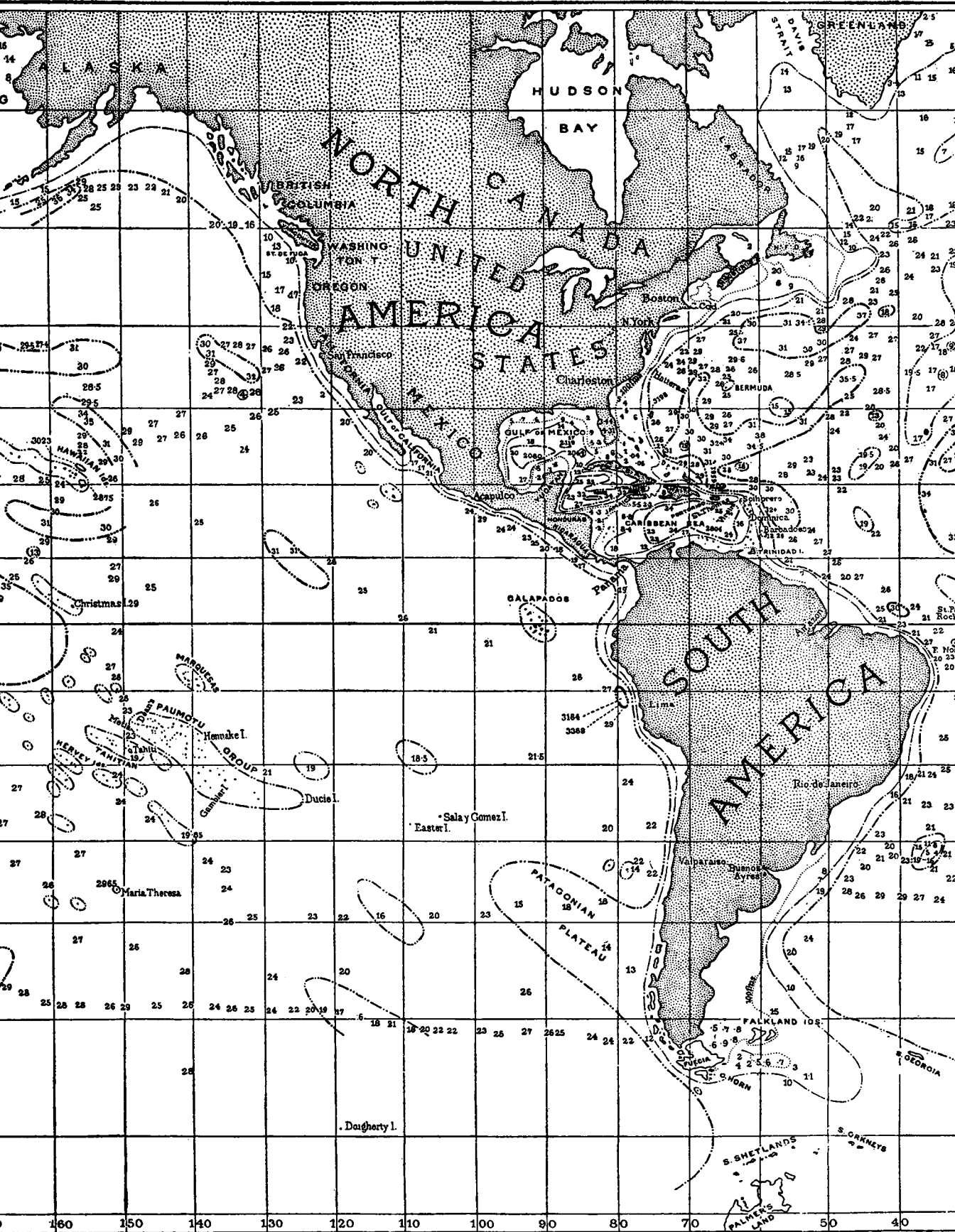
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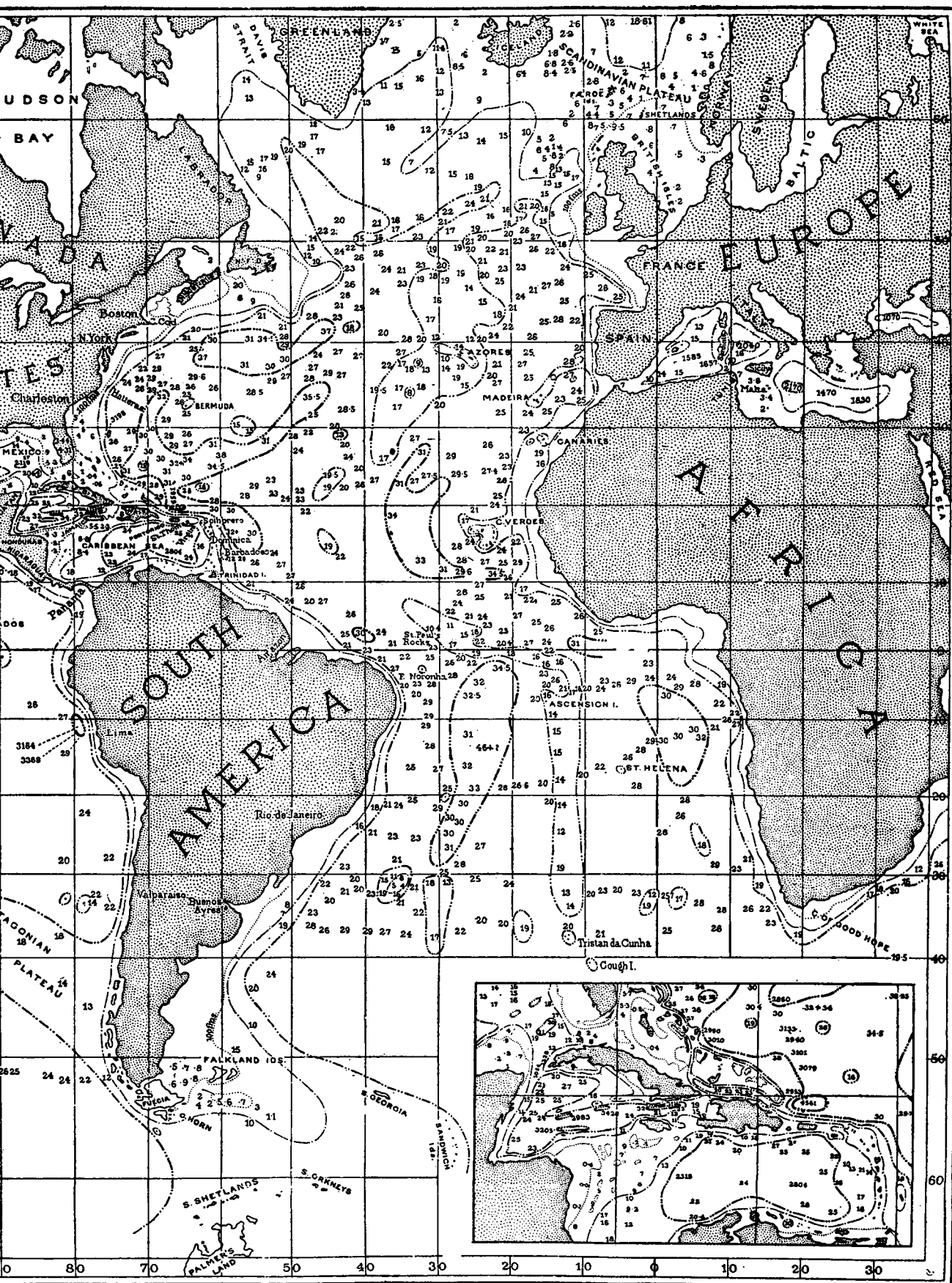
THE DEEP TROUGHS OF THE OCEANIC DEPRESSION.—  
Prof. James D. Dana, in the *American Journal of Science*, for March, 1889, discusses the subject of the deep troughs of the oceanic depression, with a general conclusion against their supposed volcanic origin. No more than this is possible, he remarks, in the absence of an accurate map of the heights and depths through all the great area. The paper is illustrated by a bathymetric map (here reproduced), with accompanying explanations. In the preparation of the map Prof. Dana used the charts of the Hydrographic Departments of the United States and Great Britain and the lists of new soundings given in German and other geographical journals.

In order that the facts on which the bathymetric lines are based may be before the reader many of the depths are given, but in an abbreviated form, 100 fathoms being made the unit; 25 signifying 2,500 fathoms or nearly (between 2,460 and 2,550); 2.3, about 230 fathoms, .4, about 40 fathoms. Only for some deep points is the depth given in full. The addition of a plus sign (+) signifies no bottom reached by the sounding.

Some divergences from other published bathymetric maps are explained. The northern half of the North Pacific is generally made part of a great 3,000 fathom







area (between 3,000 and 4,000), stretching from the long and deep trough near Japan far enough eastward to include the soundings of 3,000 fathoms, and over in mid-ocean along the 35th parallel. Prof. Dana thinks it more reasonable to confine the deep-sea area off Japan to the border-region of the ocean, near the Kurile and Aleutian Islands, and leave the area in mid-ocean to be enlarged as more soundings shall be obtained.

Again, in the South Pacific, west of Patagonia, the area of relatively shallow soundings (under 2,000 fathoms) extending from the coast, is usually bent southward at its outer western limit so as to include the area of similar soundings on the parallel of  $40^{\circ}$  and  $50^{\circ}$ , between  $112^{\circ}$  and  $122^{\circ}$  W. The prevailing trends of the ocean are opposed to such a bend, and Prof. Dana does not adopt it. In the Antarctic Atlantic a large area of 3,000 and 4,000 fathoms has been located about the parallel of  $66\frac{1}{2}^{\circ}$  S. and the meridian of  $13\frac{1}{2}^{\circ}$  W. The authority for this was a sounding made in 1842 by Capt. Ross, R. N., who found no bottom with a line of 4,000 fathoms. The means available at the date given were not "sufficient to ensure the accuracy of such deep casts."

In a bathymetric map the trends in feature-lines are the trends of the great mountain ranges themselves, and, in the Pacific, these mountain courses are those of half a hemisphere.

Prof. Dana states briefly some of the deductions from such a map :

1. Over the Pacific area there are *no* prominent north-and-south, or meridional courses in its ranges, and

none over the Atlantic, except the axial range of relatively shallow water in the South Atlantic. There are none in the great ranges of Asia and Europe, excepting the Urals; none in North America; none in South America, excepting a part of those on its west side.

2. The ranges in the Pacific have a mean trend of not far from northwest-by-west. One *transverse* range crosses the middle South Pacific, beginning to the south in New Zealand and the islands south of it, with the course N.  $35^{\circ}$  E., and continuing through the Kermadec Islands and the Tonga group, the latter trending about N.  $22^{\circ}$  E.

3. The oceanic ranges are rarely straight, but change gradually in trend through a large curve or a series of curves, and the intersections of crossing ranges, curved or not, are in general nearly rectangular.

4. Approximate parallelisms exist between the distant ranges or feature-lines; as (1) between the trend of the New Zealand range and that of the east coast of North America; and also that of South America (continued across the ocean to Scandinavia); also (2) between the trend of the foot of the New Zealand boot with the Louisiade group and New Guinea farther west, and the mean trend of the islands of the Central Pacific and that of the north shore of South America.

5. The relatively shallow-water area which stretches across the North Atlantic from Scandinavia to Greenland is continued south-westward in the direction of the axis of the North Atlantic and becomes the "Dolphin shoal."

It is suggested that it may be a correlate fact that a Patagonian plateau stretches out from high southern lat-

and in a note Prof. Dana calls attention to the parallelism between the Mediterranean Sea and the West India (or West Mediterranean) Sea that divides North from South America. Both these seas have an *eastern, middle* and *western* deep basin.

Their depths are, in the Mediterranean, 2,170, 2,040 and 1,585 fathoms; in the West Mediterranean (the three being the Caribbean, the West Caribbean or Cuban, and the Gulf of Mexico), 2,804, 3,428 and 2,080 fathoms. Further, in each Mediterranean Sea, a shallow-water plateau extends from a prominent point on the south side, northward, to islands between the eastern and middle of the deep basins; one from the northeast angle of Tunis to Sicily, the other from the northeast angle of Honduras to Jamaica and Haiti, the two about the same in range of depth of water.

The general truths illustrated by the map are: that system in the feature-lines is a fact; that the system is world-wide in its scope; and that it had its foundation in the beginning of the earth's genesis and was developed to full completion with its growth.

Facts which favor the volcanic origin of the troughs are:

1. The existence of the depressions in the close vicinity of the Hawaiian Islands, one 3,023 fathoms deep to the northeast of Oahu and another 2,875 fathoms deep east of Hawaii; besides a trough 450 miles northeast of Oahu with a depth of 3,000 to 3,540 fathoms, and another, as far south, with soundings of 3,000 to 3,100 fathoms.

2. The depth of 4,475 fathoms found by the *Challenger* off Guam, the largest island of the volcanic Ladrões, in the western North Pacific.



3. The fact that east of Japan and the Kuriles, a region of ranges of volcanoes, there is the longest and deepest trough of the ocean, the length 1,800 miles, the depths 4,000 to 4,650 fathoms ; while farther northeast, south of one of the Aleutian islands, a depth of 4,000 fathoms occurs again, and still farther east depths of 3,100 to 3,664 fathoms are found.

On the other hand there are striking examples of the absence of deep troughs from the vicinity of eminently volcanic regions. With the exception of a short trough with soundings of 3,000 to 3,368 fathoms close to the Peruvian shore, the depth of the ocean off the western border of North and South America is between 2,000 and 2,700 fathoms, and just south of Valparaiso it shallows to 1,325 fathoms. It deserves consideration, however, that the waters of this border of America deepen abruptly compared with those of the Atlantic side.

Off Central America where the volcanoes are quite near to the ocean, the depths are between 1,500 and 2,500 fathoms. The condition is the same off the west coast of North America.

In the North Atlantic the North American side has larger areas of deep water and much greater mean depth than the European side with its volcanoes. The volcanic Azores have depths around them of only 1,000 to 2,000 fathoms and no troughs. Iceland is in still shallower waters ; and the Canaries, though volcanic, have no deep trough near them. Many of the deep areas in the Pacific are so situated that no reason is apparent for referring them to a volcanic origin. The seven 3,000-fathom areas of the Atlantic occupy positions that suggest no relation to volcanic conditions.

A possible volcanic origin is admitted for the depression of 2,445 fathoms 40 miles west of the Cape Verde Archipelago and for that of 2,060 fathoms within 20 miles of Ascension Island. The most remarkable depths of the Atlantic are in the West Indies, the deepest trough, 4,561 fathoms, being within 70 miles of Porto Rico, an island which has no great volcanic mountain. North of the Bahama belt of coral reefs and islands, the depth becomes 2,700 to 3,000 fathoms within 20 miles of the coast line, and at one point 2,990 fathoms within 12 miles and there is nothing to suggest a volcanic cause for the descent.

Prof. Dana holds the opinion that the arrangement of the deep sea troughs in the two halves of the oceans points to some other than a volcanic origin. The *western* half of the Atlantic and Pacific oceans contains much the larger part of the 3,000-fathom areas and all the depths over 4,000 fathoms. Viewed as a whole, the Pacific may be said to have a westward slope in its bottom or from the South American coast toward Japan. This slope exists even in the area between New Zealand and Australia. In the Atlantic, the slope is in the direction of its northeast-northwest axis, either side of the Dolphin shoal, but especially the western side, rather than from east to west. Owing to the system in the Atlantic topography, the Dolphin shoal—the site of what Prof. Dana unkindly calls the *Atlantis* of “ancient and modern fable”—is really an appendage to the eastern continent, that is to Europe, and is shut off by wide abyssal seas from the lands to the west.

It is to be noted that in the Indian Ocean the greatest depths are found in the *eastern* part, off the

northwest coast of Australia and near western Java and Sumatra.

THE FOURTH CENTENARY OF THE DISCOVERY OF AMERICA.—The Madrid *Real Academia de la Historia* has made public the following programme of an International Competition for 1892 :

A competition is opened to solemnize this great occasion by a literary monument that shall endure and record it.

The work must be a composition in prose, a judicious historical picture, that shall correctly set forth the greatness of the event which is to be celebrated.

From the beginning of the sixteenth century to the present day so much has been said upon this subject that it seems difficult to write anything new and good.

With regard to details, perhaps, and the circumstances of the life and acts of Columbus, there remains not a little to be investigated, but the Royal Academy of History is already busied with this task of erudition and diligence in the collection and publication of documents previously unpublished, or not widely known.

The book now proposed for competition must be of a different order. It must be comprehensive and compendious, and sufficiently concise, without becoming dry or obscure.

In the abundance of works on the history of America, on voyages and discoveries, on the science of geography and the European establishments in the most distant regions of the world, there is no one book that sets in its proper light the combined action of the nations of the Iberian peninsula in the sixteenth century, when

they carried out in a hundred years of unexampled effort, with firmness of purpose and astonishing steadiness and tenacity, the exploration of vast islands and continents, and crossed oceans never before ploughed by the keels of a Christian people, and gained in their rivalry with each other an almost complete acquaintance with the planet on which we live.

In this work there is a progressive interest, as well as a manifest unity. Passing over the indications afforded by some maps, such as the Catalan of 1375, and by half-fabulous voyages like those of Doria and Vivaldi and by others better authenticated, but still isolated and without result, like that of Ferrer, this unity, in what it contains of most important, begins with 1434, when Gil Eannes doubled Cape Bojador, discovered Guinea and dissipated the terror that brooded over the dark ocean, and ends with 1522, when Elcano arrived at San Lúcar after having sailed around the world.

In all this action but little was left to chance. The progressive series of geographical discoveries, due to persistent forethought and not to accident, finds its origin at Sagres with Prince Henry the Navigator and his illustrious pilot, Jaime de Mallorca.

From that time until the form and the magnitude of the terraqueous globe became clearly known, Pedro Núñez might well boast that nearly every result had been obtained, not by following mere conjecture, "but because our navigators went well instructed and provided with instruments and with rules of Astrology and Geography, things not to be dispensed with by cosmographers."

The culminating point in the development of this

beautiful history is reached on the 12th day of October, 1492, when Columbus was the first European to set foot on the intertropical soil of the New World ; but this event, beyond the significance it has, when considered in itself alone as an effect of the individual inspiration of a seaman and of the generous enthusiasm of the queen who protected him, is found to possess a higher meaning when taken in conjunction with the entire action, and with the unfolding of the design to explore the whole globe and to extend everywhere the law and the name of Christ with the civilization of Europe, no less than to take possession of the gold and spices and riches of every kind, known only by costly specimens and exaggerated reports, furnished by the Venetian and Genoese and Catalan traders into whose hands these products were delivered by the Mohammedans.

Undoubtedly the force which moved the men of our peninsula to an enterprise like this was the resultant of whatever great sentiments, evil and good, are to be found in the heart : religious fervor, thirst for glory, ambition, Christian charity, greed, curiosity and eagerness to penetrate the unknown, and, above all, the longing, in the full day of the Renaissance, to seek and to encounter real adventures that should eclipse the fantastic, vain and aimless stories of the books of chivalry, and to accomplish voyages and conquests that should surpass those of the Greeks and the Romans and the fables of classical antiquity, then freshly revived by scholars and made familiar to all men.

What is to be written is the complete representation of all this enterprise, so that its vast significance may be distinctly seen without in any way lessening the convic-

tion that the conceptions, the marches and the voyages and the successful daring of Bartolomé Diaz, Gama, Albuquerque, Cabral, Balboa, Magellan, Cortés, Pizarro, Orellana, and so many others, far from diminishing the glory of the hero whose centenary is to be celebrated, do but serve to heighten it ; and to display in its most luminous aspect the work of civilization, in which Portugal laid the foundation, while Castile, with Columbus, bore the principal and the most arduous part, and all Spain gave to the task its fitting conclusion by opening the strait that bounds the American continent, and crossing for the first time an ocean mightier than the Atlantic and circumnavigating the globe.

The book, thus dimly outlined, must present in a compendious introduction notices of voyages, ideas, and geographical advancement up to the establishment made by Prince Henry the Navigator at Sagres ; and must close with a more extended conclusion, in which shall be considered and estimated the changes and the ameliorations that have been the consequence of our collective work ; in commerce, in the economical and political condition of the peoples, in the broad field thrown open for the spread and the domination of the intelligent European activity, in the abundance of facts observed and hopes well-founded, and in the more certain basis afforded to scholars and scientific men for the better understanding of Nature, the penetration of her mysteries and the unveiling of her laws.

The elevation and magnitude of the subject require that the book shall be a finished work of art, not as regards richness and ornament of diction, but as to the arrangement of the plan and the sobriety

and purity of style, which must owe its nobleness and beauty to the clearness of the language, the correctness of the judgment and the sustained force of the thought.

Any unpublished work, written especially for this occasion in Spanish, or Portuguese, or English, or German, or French, or Italian, may be sent in for competition.

The award will be made by a Tribunal composed of two members of the *Real Academia de la Historia*, and one member of each of the following Academies: the *Real Academia Española*, the *R. A. de Ciencias morales y políticas*, and the *R. A. de Ciencias exactas y naturales*, the members to be chosen by the respective Academies; and a seat in the Tribunal shall belong to the diplomatic, or specially designated, Representative of every Power, a subject of which shall present through him a book for the competition.

The Tribunal shall elect its own President and shall render its decision upon the works submitted by absolute majority of votes of those present at the time of voting.

The works submitted must be neatly bound and written in a legible hand on good paper, without the author's name, and inscribed with a motto.

The same motto and the first phrase of the work shall be written upon the outside of a sealed envelope, which shall contain in each case the name and the residence of the author.

The sealed envelopes, identifying the works which do not obtain a prize, shall be publicly burned unopened.

Although it is difficult to assign an exact limit to such a work, it ought not to exceed the reading matter contained in 2 volumes of 500 pages each, of the size and type of the complete works of Cervantes, edition of Rivadeneyra, 1863 and 1864. (This edition is an imp. 8vo, with about 450 words to the page.)

Nevertheless, as some margin must be allowed, there may be added to the text, if the plan or the development of any one of the works requires it, a supplementary volume of documents, maps and other illustrations.

In order to afford time for examination and judgment, the works intended for the competition must be delivered to the Secretary of the *Real Academia de la Historia* before the 1st of January, 1892.

There will be a first prize of 30,000 pesetas (\$5,625) and a second prize of 15,000 pesetas (\$2,812.50). In addition to these, each author will receive 500 copies of his work when printed.

It will be for the Committee on the Centenary to determine the number of copies of which the edition of each work shall consist, and the disposition to be made of the copies not delivered to the authors.

The authors shall retain the right of property in their works, and the right to reprint them, to sell them and to have them translated into other languages.

The Committee, however, reserves the right if the award shall be made, in either or in both cases, in favor of works written in a foreign language, to have these translated and published in Spanish.

The preceding conditions are given to the press by the Committee for the information of the public, and for



the guidance of those who may desire to take part in the competition.

MADRID, June 19th, 1889.

DUQUE DE VERAGUA,  
*Vice-President.*

JUAN VALERA,  
JUAN F. RIAÑO,  
*Secretaries.*

THE ROYAL SOCIETY OF NEW SOUTH WALES offers its medal and a money prize for communications on the following subjects :

SERIES IX.—*To be sent in not later than 1st May, 1890.*

No. 31.—The Influence of the Australian Climate (general and local) in the Development and Modification of Disease. The Society's medal and £25.

No. 32.—On the Silver Ore Deposits of New South Wales. The Society's medal and £25.

No. 33.—On the Occurrence of Precious Stones in New South Wales, with a Description of the Deposits in which they are found. The Society's medal and £25.

SERIES X.—*To be sent in not later than 1st May, 1891.*

No. 34.—The Meteorology of Australia, New Zealand and Tasmania. The Society's medal and £25.

No. 35. Anatomy and Life History of the Echidna and Platypus. The Society's medal and £25.

No. 36.—The Microscopic Structure of Australian Rocks. The Society's medal and £25.

The competition is in no way confined to members of the Society, nor to residents in Australia, but is open to all without any restriction whatever, excepting that a prize will not be awarded to a member of the Council

for the time being ; neither will an award be made for a mere compilation, however meritorious in its way. The communication to be successful must be either wholly or in part the result of original observation or research on the part of the contributor.

The Society is fully sensible that the money value of the prize will not repay an investigator for the expenditure of his time and labor, but it is hoped that the honor will be regarded as a sufficient inducement and reward.

The successful papers will be published in the Society's Annual Volume. Fifty reprint copies will be furnished to the author free of expense.

Competitors are requested to write upon foolscap paper—on one side only. A motto must be used instead of the writer's name, and each paper must be accompanied by a sealed envelope bearing the motto outside and containing the writer's name and address inside.

All communications to be addressed to the Honorary Secretaries.

	A. LIVERSIDGE,
37 Elizabeth Street, Sydney.	F. B. KYNGDON,
	<i>Honorary Secretaries.</i>

LAKE CHAMPLAIN.—In Appendix No. 7, Report of the U. S. Coast and Geodetic Survey for 1887, Mr. Charles A. Schott makes a preliminary report on the fluctuations in the level of Lake Champlain, and the average height of its surface above the sea.

The average elevation of the lake, as given by various authorities up to 1887, was generally confined within the limits of 90 and 100 feet, and there was no great error in any one estimate.

With the data at command, Mr. Schott fixes the height above the mean sea-level at 29m.618, or 97.17 feet.

The statements as to the greatest depth of the lake show a wide discrepancy between 252 feet, accepted by some authorities, and 600 feet, as given in Lippincott's *Gazetteer* (1882). The deepest sounding made by the Coast Survey in 1870-74, and published in 1879-80, was 399 feet, off Wing's Point, in lat.  $44^{\circ} 18'$ , long.  $73^{\circ} 19'$ . Mr. Schott finds reason for adding 3 feet to this result, and fixes the depth at 402 feet; more than 300 feet, that is to say, below the level of the Atlantic Ocean.

The irregular, periodic, and secular variations in the lake level as observed during twelve years, indicate a *total* range of 8 feet at the northern outlet, and no doubt this range is greatly exceeded at points near the opposite extremity under the influence of strong and continuous northerly winds. (By *secular* variations Mr. Schott seems to mean the variations for the period during which observations have been made.)

The mean variation, according to 12 years' observations, from 1871 to 1882, was 2.64 feet, and the annual observations showed that the lake level was highest in May and lowest in October.

CLIMATOLOGY OF PENNSYLVANIA.—The Annual Report of Thos. J. Stewart, Secretary of Internal Affairs of Pennsylvania, for the year ending Nov. 30, 1888, includes a paper covering more than 200 pages on the Climatology of the State, by Lorin Blodgett.

Observations at 180 stations are given for periods

varying from a few months at some to a continuous record of 69 years at Morrisville, Bucks County.

For Philadelphia, the independent reports number 22, many of them, of course, contemporary and aggregating 300 years.

The study of these records reveals, according to Mr. Blodgett, a perfect symmetry in the curves of temperature. In all cases the minimum is in January, and later than the middle of the month. January is  $3^{\circ}$  colder than December, and February is  $1^{\circ}.5$  warmer than January. In the colder parts of the State, March is a full winter month, with a mean of  $30^{\circ}$ , while at Philadelphia, Lancaster and Harrisburg, the mean for March is  $40^{\circ}$ .

These three cities typify the climate of the southern part of Pennsylvania.

The spring months should include June, and from April to June the increase of heat is  $10^{\circ}$  for each month over the preceding month. In many cases the March mean being near  $40^{\circ}$ , that for April is  $50^{\circ}$  to  $51^{\circ}$ , that for May  $60^{\circ}$  to  $62^{\circ}$ , and that for June  $70^{\circ}$  to  $71^{\circ}$ .

The declining side of the thermal curve shows a fall of  $3^{\circ}$  from July to August. one of  $6^{\circ}$  from August to September, and one of  $11^{\circ}$ , each, from September to October and from October to November. From November to December the fall is  $10^{\circ}$ .

Mr. Blodgett's paper is illustrated by a map showing the isothermal lines and the elevations above tide-water.

INFORMATION REGARDING THE GEOGRAPHY OF MINNESOTA.—The Minnesota Historical Society of St. Paul, under date of July 12, 1889, calls attention to the following Act of the Legislature of the State :

(H. F. No. 702.)

AN ACT TO FIX THE NAME OF A LAKE  
FORMERLY KNOWN AS ELK LAKE.*Be it enacted by the Legislature of the State of Minnesota :*

SECTION 1. That the lake known for many years to the Indians and early explorers as Elk lake, situated in Beltrami county, in section twenty-two (22) of town one hundred and forty-three (143) north, range thirty-six (36) west, fifth principal meridian, shall be known and designated hereafter on all official maps of the State, and named in all county and State records referring to the same, as "Elk Lake."

SEC. 2. No edition of any school geography, published subsequently to January one, eighteen hundred and ninety, which contains any map giving any name to the lake specified in section one other than "Elk lake," shall be used in the schools of this State.

SEC. 3. This act shall take effect and be in force from and after its passage.

Approved April 24, 1889.

It is added that the action of the Legislature was "occasioned by the fact that one Willard Glazier had (in 1881) endeavored to have the name 'Elk Lake' changed, and called for himself, and he issued maps with his name on them, and also prevailed on map publishers to make the same change. Such changing of the name of Elk Lake was without any sanction of authority, and is not recognized by the people of the State, as the passage of the above act evinces." This should dispose of Capt. Glazier, but many things that should be are not.

THE NAME OF AMERICA.—M. L. Gallois, professor of history and geography at Lyons, writes in the September *Bulletin* of the Lyons Geographical Society a brief criticism of Mr. Jules Marcou's *Nouvelles Recherches sur l'Origine du Nom d'Amérique*. M. Gallois remarks that the true name of the mountains, which Mr. Marcou calls the *Amerrique* range, is *Amerrisque*; that there is no reason to believe that Vespucci ever saw the coast of Nicaragua; that Vespucci's name was *Amerigo*; and that Waldseemüller's positive statement in the *Cosmographie Introductio* that he took the name he gave to America from the name of Vespucci must be accepted.

Mr. Marcou denounces Waldseemüller as "a block-head, a mere salaried assistant, occupied in the preparation of maps for a new edition of Ptolemy, and in proof-reading in the printing establishment of the Luds."

At this rate, asks M. Gallois, what is to be said of Erasmus, who did not disdain to correct proofs for his friend Froben? And who can believe that the Ptolemy of 1513 was produced by the first man that came along?

Mr. Marcou first published his hypothesis in 1875. "He tries now," says his critic, in conclusion, "to support his theory by facts; but this he ought to have done in the beginning. The Paris Geographical Society, fortunately, does not make itself responsible for the opinions which it prints, but we must regret that it was generous enough to give up eighty pages of its *Bulletin* to this fantastic paper."

THE YUKON DISTRICT.—Among the recent publications of the Geological and Natural History Survey of Canada is Dr. George M. Dawson's report on his ex-

ploration of the Yukon District and the adjacent northern portion of British Columbia. The region is bounded to the south by the 60th parallel of latitude, to the west by Alaska, to the east by the Rocky Mountain Ranges and the 136th meridian, and to the north by the Arctic Ocean; and it has an area of about 192,000 square miles, of which over 150,000 are included in the watershed of the Yukon.

The main geographical results were: an instrumentally-measured line from the head of Lynn Canal to the intersection of the Yukon or Pelly by the 141st meridian; an instrumental survey of the Stikine from its mouth to the head of navigation (Telegraph Creek), connected with Dease Lake by a carefully paced traverse; a detailed running or track-survey following the lines of the Dease, Upper Liard and Pelly rivers and connecting with the line at the mouth of the Lewes.

The entire distance travelled during the exploration amounted to 1,322 miles, and this, taken in connection with the coast-line between the Stikine and Lynn Canal, circumscribes an area of about 63,200 square miles, the interior of which is still practically a *terra incognita*. The same description, says Dr. Dawson, with little qualification, applies to the whole surrounding region outside the surveyed circuit; so that there remain scope and verge enough for future explorers in the 192,000 square miles of the Yukon District. Along the routes travelled numerous points were carefully fixed in latitude by sextant observations, and a sufficient number of chronometer longitudes were obtained to lay the whole down within small limits of error. Special attention was paid to the fixing of mountain topography in sight from

the line of travel and approximate altitudes of more prominent peaks were ascertained.

Dr. Dawson was disappointed in the size of the Yukon River where he saw it below the confluence of the Lewes. At this point the Yukon (or Pelly, the name Dr. Dawson inclines to prefer) was about 1,700 feet in width, with a maximum depth of about ten feet, and there seems to be little doubt that its magnitude has been exaggerated in previous reports. Its total drainage area is but 331,000 square miles, less than half that of the Mackenzie, and there is nothing to show that there is any serious difference in the amount of precipitation over the two areas.

Lieut. Schwatka's dealings with the nomenclature of rivers and places in this region do not commend themselves to Dr. Dawson. He holds, fairly enough, that the old established and prior name of the Lewes River should not be arbitrarily erased in favor of the Yukon, and he declares that it is in any case incorrect to assert that the Yukon (Lewes) rises in Lake Lindeman, for the greater part of the water of the river enters by the Taku arm of Tagish Lake. Due credit is given to Lieut. Schwatka for having made the first (and reasonably accurate) survey of the river, and many of the names he invented are retained by Dr. Dawson, "more especially in view of their scientific eminence."

This seems to be a mistaken principle. It would be an act of presumption on the part of a tourist to bestow names on mountains and rivers at his own pleasure, and the license refused to him should be all the more sternly refused to an explorer who is under serious bonds to truth and to history and to the civilized world.



The report is illustrated by a map on a scale of 1 : 506,880, in three sheets.

WINTER NAVIGATION OF THE ST. LAWRENCE RIVER.—This subject, which has been taken up by the Quebec Geographical Society, is treated at considerable length in the *Transactions*, just issued, for the years 1886–87,–88–89.

Letters are printed from mariners and other persons of experience, all to the effect that the practical difficulties in the way of the desired end may be overcome. It is declared that the complete success of the ice-boats used in Sweden and Denmark for opening the Cattegat has solved the problem.

An extract from *Le Génie Civil*, of December, 1886, gives an account of the first experiments made at Gottenburg, where a channel was cut with ease through ice 13 inches thick. This triumph moved the people of Christiania, in *Sweden*, to follow the example, and this strange conduct does not seem to have surprised the Quebec geographers.

Capt. N. LeVasseur vigorously calls for action by the Dominion Government, and urges upon its attention two important considerations :

“ 1st. That many countries, in a position identical with our own as regards winter navigation, will profit by the experiments made in Canada ; 2d. That thousands upon thousands of the Canadian people, from one end of the Confederation to the other, will be greatly benefitted, some directly and others indirectly, by the definitive solution of the problem.”

Other papers in the *Transactions* are : The Landfall

of Cabot, by Mr. J. P. Howley, who does not take Prof. Horsford's view ; The Moundbuilders of North America ; Lake Mistassini ; The Copper River Indians ; Notes on Labrador, etc.

A tribute of respect is due to the energy and steadfastness with which the Quebec Geographical Society has borne up under the discouraging conditions of the past four years, and it is to be hoped that the future holds for it nothing but prosperity.

STORM SIGNALS AT HAVANA.—The U. S. Hydrographic Office publishes in the Pilot Chart of the North Atlantic for September the system of storm signals, which went into effect at Havana on the 2d August, and will be observed during the hurricane season (July—October) in the West Indies :

TRIANGULAR RED FLAG.—Cautionary signal.

SQUARE FLAG, YELLOW AND BLUE HORIZONTAL STRIPES.—Storm signal.

BLACK BALL.—The port is closed.

BLACK BALL OVER TRIANGULAR RED FLAG.—Indications of clearing weather.

BLACK BALL OVER YELLOW AND BLUE FLAG.—Clearing weather.

The signals are shown at the office of the Captain of the Port and at the Morro Semaphore Station.

THE MEXICAN FLOODS OF 1888.—The *Observatorio Meteor.-Magnético Central*, of Mexico, has issued a very full supplement to the December number of its *Boletín*. This supplement contains detailed reports of the disastrous floods in the month of June, 1888, the re-

sult of the excessive rains which began on the 6th and continued to the end of the month, over a surface "comprehended between the parallels of  $16^{\circ}$  and  $50^{\circ}$  N., and the meridians of  $62^{\circ}$  and  $107^{\circ}$  W. of Greenwich, embracing, therefore, in the United States the States on the Atlantic and the Gulf, and those adjacent and covering the Mexican Republic in a N. E.—S. W. direction to the S. of a line drawn from the extreme northwestern part of Tamaulipas to Mazatlan. In all this region it rained from the Gulf to the Pacific."

The destruction, great everywhere throughout this vast extent, was most marked in the city of Leon, in the State of Guanajuato. The population numbered 80,000, and out of the 249 blocks, or squares, of houses in the city, 117 were inundated and 79 were completely destroyed.

Two hundred and fifty-two dead bodies were recovered, but many were swept away by the waters.

The latter and larger part of the supplement is devoted to an account of the September cyclone of 1888, which wrought such havoc in Cuba and the north of Yucatan.

This interesting publication is illustrated by maps of the cities of Leon and Lagos, showing in colors the inundated portion of each, and by a third, representing the path of the hurricane across the island of Cuba.

DRAINAGE OF THE VALLEY OF MEXICO.—The *Railroad and Engineering Journal*, for September, gives a map and a brief description of the plan, now in process of execution, for relieving the city of Mexico from the dread of inundation. The city stands on the shore of

Lake Tezcoco, the lowest of the six lakes in the Valley, which has an area of about 1,650 square miles.

The canal, the principal feature of the plan, is divided into two parts, the first, 12.4 miles in length, to carry water from the lake to the city, and the second, nearly three times the capacity of the first, to carry the surplus water of the lake and the discharge from the city. This second section is 17.4 miles in length and 21 feet in depth; and the fall for the whole length is 1 : 5,000. The most important part of the work is the tunnel, which will begin at the end of the canal and extend through the mountains for a distance of 5.9 miles, with a deep cutting of 1,640 feet in length at the outer end. The fall through the tunnel will be 1 : 1,000 and the cross-section will be semi-ovoid.

The upper or arch part of the tunnel will be lined with brick, and the lower part with stone and cement; and much of the work which was done over twenty years ago can be utilized in the construction of the canal.

LABRE'S EXPLORATIONS IN BRAZIL AND BOLIVIA.—The August number of the Royal Geographical Society's *Proceedings* has an account, contributed by the Peruvian Vice-Consul at Southampton, of Col. Antonio R. P. Labre's journeys in the region comprised between the Beni and the Purus rivers. These journeys, performed at various times between the years 1872 and 1887, were undertaken mainly for the purpose of investigating the resources of the country and exploring commercial routes. In his earlier visits the traveller became familiar with the Ituxy River, a tributary of the Purus, navigable

during the wet season for 370 miles, and in 1884 he took two steamers up to the mouth of the Curykethé, 200 miles from the Purus. There he established india-rubber stations, which are visited every year. Up to this point the banks of the Ituxy are low and often flooded, but beyond it the ground is higher. The soil is good, and the river flows through a forest. There live in this district tribes of Indians, still in a wild state. Each tribe has numerous small villages governed by one or two chiefs. In 1879 three youths of the Hy-puriná tribe were entrusted to Col. Labre for education and one of them has learned how to read and write. The whole number of the natives living on the Purus and its tributaries is estimated at 40,000, speaking forty or more different languages.

The principal journey was the one made in 1887 for the purpose of crossing overland from the india-rubber settlements on the Madre de Dios, an affluent of the Beni from the west, to the nearest navigable point on the Aquiry tributary of the Purus, in order to ascertain if the ground offered facilities for the construction of a road. Col. Labre ascended the Madeira from the Amazon, with a well-equipped party of Bolivian traders, to San Antonio at the foot of the falls. From this place to Villa Bella, at the mouth of the Beni, is a distance of 161 miles. All the trade between the Amazon River and Bolivia passes this way. There are nine falls or rapids to be turned by unloading the canoes and dragging them overland on wooden rollers, and Col. Labre took 34 days to accomplish the journey. He ascended the Beni, which has low, forest-covered banks, with many islands in the stream, and inland lakes com-

municating with it from both sides, up to its junction with the Madre de Dios.

At Port Maravilha on this river he began his overland march. The country was covered with forest, part of it composed of Brazil-nut trees. The first village was inhabited by civilized Araúnas. Three days later the party came to a second settlement, where they passed the night; and two days after to a third, with about 200 inhabitants. These Araúnas had a form of government (which is not described), temples, and worship. The villagers had plantations.

Their women are not allowed to enter a temple nor to take part in the religious or fetich ceremonies, and they are forbidden to know the names or the forms of the idols. These idols are geometrical figures made of polished wood. The father of the gods is called Epy-mará; his figure is of elliptical form and about 16 inches high. There are also gods of stone. There are "medicine-men" charged with religious duties and living a celibate life, and the chief is the *pontifex*.

Another chief, at a place called Cuyneputshúa, undertook to pass Col. Labre on to the Guarayos, a neighboring people. Up to this point the march had been in a northwesterly direction; but here it turned to the west, and led through a country like that already traversed, full of streams and dense forests. At the Caramánu River the Guarayo district was reached and the original northwesterly direction was resumed.

Beyond the Guarayo district was that of the Cannamary, who did not seem to be pleased at the sight of the white men; and Col. Labre thought it prudent to withdraw to the forest for the night.

The march was resumed the next day, but the people fled from the strangers. Another tribe, the Cannarana, acted in the same way, but there were no mishaps, and on the 30th August, 20 days after beginning his overland journey, Col. Labre arrived at Brejo da Ponte, on the Aquiry River. He reports that the route is practicable, and will become, especially if a railway is constructed, the highway for all the trade of the Mamoré and Beni basins.

LAKE TITICACA.—Dr. Alfred Hettner in his third Report on his travels in Peru and Bolivia (*Verhandlungen der Gesellschaft für Erdkunde*, Berlin, No. 6, 1889), notes the evidences of great changes in the level of Lake Titicaca, in the terraces which surround it. He believes that in a comparatively recent geological period the surface must have been about 65 feet higher than it is now, and that the lake extended over the greater part of the neighboring plains, perhaps even as far as the Poopo (or Aullagas) Lake. At an earlier date the level must have been, as numerous indications show, 660 feet higher than at present, but there are signs also that it must have been depressed at one time below the level of to-day. The highest mark of the lake-level is older than the evidences of glacial action in the region, and contemporaneous with a period of especially strong volcanic activity, and certainly of the later Tertiary; and the 65 feet terraces may belong to the glacial period.

Dr. Hettner could find not the least support for the theory that the lake was in ancient times covered by the sea; but he is not prepared, in the absence of acquain-

tance with the southern portion of the highlands, to deny that a communication between the lake and the ocean may have existed in the time of the 660 feet terraces.

IMMIGRATION INTO THE ARGENTINE REPUBLIC.—The *Boletin*, Vol. 10, No. 5, of the *Instituto Geográfico Argentino* gives a table showing the movement of immigration into the Republic since 1857. The table is official, having been prepared by the Superintendent of the Department of Immigration, and its figures tell a plain story. The arrivals were :

In 1857 .....	4,951	In 1873.....	76,332
1858.....	4,658	1874.....	68,277
1859.....	4,735	1875....	42,066
1860.....	5,656	1876.....	30,965
1861.....	6,301	1877.....	36,325
1862 .....	6,716	1878.....	42,958
1863.....	10,408	1879.....	55,155
1864.....	11,682	1880.....	41,651
1865.....	11,767	1881.....	47,484
1866... ..	13,696	1882.....	51,503
1867.....	17,046	1883.....	63,243
1868.....	29,234	1884.....	77,805
1869... ..	37,934	1885.....	108,722
1870.....	39,967	1886.....	93,116
1871 .....	20,933	1887.....	120,842
1872.....	37,037	1888... ..	155,632
		Total. ....	1,374,797

Of this number 990,192 came directly from beyond sea and 384,605 by way of Montevideo.

The figures do not include the 250,000 first-class passengers who entered the country during the thirty-two years; so that the whole immigration for the period amounted to 1,624,797.

According to the U. S. Census the arrivals of for-



eigners in the United States for the period 1790-1840-41 were 1,132,860. The next ten years added to this number 1,593,826.

Of the 990,192 immigrants from beyond sea into the Argentine Republic there were 646,086 Italians, 144,654 Spaniards, 91,759 Frenchmen, 22,952 Englishmen, 18,072 Swiss, 16,768 Austrians, 15,271 Germans, 7,645 Belgians, and 26,985 of various nationalities, not specified.

Three-fourths of the immigrants were men, the proportion of women varying from 29.5 per cent. of the Italians to 9.2 per cent. of the Belgians.

THE MANCHESTER GEOGRAPHICAL SOCIETY. — The *Journal* of the Manchester Geographical Society, hitherto published at irregular intervals, will be issued quarterly during the present year, and will so continue. It is a pleasure to note this evidence of prosperity in a society whose four years of existence have been full of good work.

GEOGRAPHY AT OXFORD. — Mr. H. J. Mackinder, M. A., Reader in Geography at Oxford, reports to the Royal Geographical Society (*Proceedings*, August, 1889) that the past Academical year has been one of steady progress. His audiences were twice as large as those of the previous year, and his subjects were :

The Physical Geography of the Continents, the British Isles, The History of Discovery, Western and Central Europe, The Mediterranean and Mediterranean Lands, and Russia and Asia with reference to History.

Prof. Freeman, Mr. Sidney Owen and Mr. George also lectured on geographical subjects.

Mr. Mackinder finds that the number of his hearers will vary from 5 to 80, and that if the Readership in Geography is to have an established position, it must be through the History School.

There is now, it seems, no separate paper on Geography set in the examination. Compulsory Geography questions are now set in the History papers and Mr. Mackinder was requested, but refused, to lecture on the geography of special periods. This he felt would make his teaching merely historical, and all that remained was to offer to historical students an elementary course which should present a general but vivid conception of the theatre of history. He is led to hope for a large class next year.

There is a tone of disappointment in Mr. Mackinder's letter, and his admissions do not sustain the promise of his opening sentence; but there is no reason why he should be discouraged.

It would be an excellent thing if geography could be studied for itself, but it has practical relations with history, and these have long constituted its chief value in the eyes of the educated public. To purge the general sight is a work of time, and the public must do its part. A great deal has been gained when 5 men, or 80 men, have been induced to study geography with or without history.

METEOROLOGY AND CLIMATE OF SUEZ.—Mr. W. G. Black, Surgeon-Major, Edinburgh, contributes to the *Journal* of the Manchester Geographical Society, Nos.

7-12, 1888, a paper on the climatic conditions at Suez before and after the opening of the Canal.

The prevailing winds are north and northwest. The hot winds are the *Khamseens*, mostly from the south but frequently from the west. They last two days, very rarely to the third day, and are followed by the etesian wind from the north. This is very violent and fills the air with fine sand so that the sky takes a yellow color.

The observations for 1866-1869 were made by Mons. Brittain; those for 1869-1872 by Dr. J. A. Woolfreys.

The monthly tables show that the average maximum of summer temperature has risen from  $102.7^{\circ}$  to  $111.5^{\circ}$  and the average minimum has fallen from  $64.7^{\circ}$  to  $60.7^{\circ}$ , while the winter temperature has advanced from  $75.4^{\circ}$  to  $86.2^{\circ}$ , maximum, and has fallen from  $46.4^{\circ}$  to  $39.8^{\circ}$ , minimum.

These changes may be partly due to the movement of water into the Canal from the heated Red Sea on the one side and from the colder Mediterranean on the other.

The summer heat at Suez often rises to  $100^{\circ}$ - $120^{\circ}$ , but the mercury sometimes falls to  $44^{\circ}$ - $32^{\circ}$ ; and in winter the range is from  $30^{\circ}$  or  $40^{\circ}$  to  $80^{\circ}$  or  $90^{\circ}$ .

The barometer in the winter months is high, but the whole range from the lowest in spring (29.59 in.) to the highest in winter (30.49 in.) is small.

WHAT IS DONE IN ZULULAND.—*L'Afrique Explorée et Civilisée*, in the number for September, 1889 (pp. 261-262), quotes from a letter addressed to it by Mr. Charles Hancock, of London, one of the Executive Committee of the Aborigines Protection Society, two

statements concerning the treatment of the Zulus by the English. In one instance, cited by Mr. Bradlaugh in the House of Commons, a native was flogged with a cat-o'-nine-tails with points of iron. In the other, according to testimony before the Court at Etshowé (Ekhowa) in the trial of Dinizulu, Cetewayo's son, and other chiefs for high treason and rebellion, it was affirmed that three hundred women and children, captured by a detachment under the orders of Maj. McKean, were handed over to Uzibepu, a favorite of the Governor's, and to his soldiers, and were only released through the exertions of Miss Colenso and her friends.

The editor of the Geneva journal asks whether it ought to be possible to commit a deed so monstrous under the name of a nation that stands in the first rank of civilization. He may be astonished to learn that a similar atrocity stands on record against the name of no less a man than Gen. Gordon. In a book published in 1881, called "Colonel Gordon in Central Africa, 1874-1879. . . . From Original Letters and Documents," edited by Dr. George Birkbeck Hill, and by him dedicated to Miss Gordon, there is (p. 345) a letter dated Edowa, March 31, and in this are the following passages: "This evening a party of seven slave-dealers with twenty-three slaves were captured and brought to me together with two camels. . . . I got the slave-dealers chained at once, and then decided about the slaves. The men and boys were put in the ranks; the women were told off to be wives (!) of the soldiers."

The "(!)" is in the printed text, and possibly represents Dr. Birkbeck Hill's amazement at the hero's decision. A few lines below is another passage: "When

I had just begun this letter another caravan, with two slave-dealers and seventeen slaves, was brought in, and I hear others are on the way. Some of the poor women were quite nude. I have disposed of them in the same way, for what else can I do?"

Contact with the less developed races undoubtedly tends to the blunting of the moral sense in civilized men, but this fact offers no excuse for Gordon. He refused, though urged, he says, "by a *Reverend*," to shoot the slave-dealers taken red-handed in these two instances, because there was no law to justify the act. He is regarded as a man of the highest type, and some writers, more familiar with names than with facts, have not been ashamed to speak of him as a Sidney or a Bayard.

Nevertheless, there are thousands of Englishmen in command, comparatively unknown men, who would die rather than be guilty of the brutality that Gordon confesses without a sign of remorse. It is by men of this stamp, in every nation, that the real work of civilization is to be done in Africa.

THE MAP OF THE TRANSVAAL.—Mr. Fredk. Jeppe, F. R. G. S., has lately brought out a map in four sheets on a scale of 15.78 miles to the inch, showing the South African Republic and the adjacent territories. The map is based on a number of authorities, official and other, and is a most creditable piece of work in style and appearance; but it has called forth a solemn protest from the Lisbon Geographical Society in a letter dated 31st July, 1889.

According to this letter the western boundary of the

Portuguese province of Mozambique is arbitrarily pushed at least half a degree too far to the east ; and this assertion is rather supported than contradicted by the legend inscribed on the boundary line : " Approximate Western Limit of Portuguese Possessions." In such cases the approximation is never made at the expense of the greater Power, actually or prospectively in possession, and the protest of the Lisbon Society ought to be recorded.

THE ERUPTION OF BANDAI-SAN.—*The Journal of the College of Science, Imperial University, Japan*, Vol. III., Part II., is wholly devoted to an account of the Bandai-san eruption of July 15, 1888, by Profs. S. Sekiya and Y. Kikuchi.

Bandai-san (Lat.  $37^{\circ} 36'$  N., Long.  $140^{\circ} 6'$  E.) is one of a number of volcanoes, active and extinct, in the province of Iwashiro. The district about the mountain is made up of tufaceous deposits and sheets of volcanic rock. On the south side of Bandai at an elevation of 1,600 ft. above the sea is the lake Inawashiro, one of the largest in Japan, not a crater lake, but fed, before the eruption, by the river Nagase. The upper course of this river was stopped by the masses thrown out by the volcano, and the lake is now supplied by a tributary stream, the Sukawa.

On the morning of July 15, 1888, the weather was fine, with a gentle breeze. Soon after 7 o'clock, curious rumblings were heard, followed by an earthquake which lasted more than twenty seconds, and at 7.45 the eruption took place. There were fifteen or twenty explosions, accompanied by dense columns of dust and steam.

At the foot of the mountain there was a rain of hot, scalding ashes, with a pitchy darkness. A little later, the darkness continuing, a smart shower of warm rain fell for about five minutes; and then a mighty avalanche of earth and rock rushed at terrific speed down the mountain, buried the Nagase valley and its people and devastated an extent of 27 square miles.

The destructive agency was merely the sudden expansion of imprisoned steam, unaccompanied by lava flows or pumice. The eruption may be compared to the firing of a tremendous gun, such an one as can only be forged by Nature.

Terrible wind blasts swept every growing thing before them. In one field of rice on the southeast of the volcano "the slender stalks were laid flat upon the ground as evenly and regularly as if they had been combed down in parallel lines. Not a stalk lay across its neighbours. The heads of rice in one furrow covered the roots in the next furrow."

After the eruption immense numbers of holes of various sizes were remarked on the mountain slopes, and the origin of these holes has been a matter of discussion among the scientists. Prof. J. Milne believes that they were caused by the earthquake shocks; but Messrs. Sekiya and Kikuchi refer them to the falling stones and fragments of rock. A number of the holes were dug open and at the bottom of each was found a mass of rock or a stone. This should seem to be decisive, though merely circumstantial, evidence.

The form of the crater is now that of a horse-shoe, open towards the north. From east to west it measures 8,080 ft., and from north to south 7,460. The original

height of the mountain, (Kobandai, or Little Bandai) is not accurately known, but it is believed to have been about 6,037 ft. The crater-bed is 3,839 ft. above the sea, and the undestroyed southwestern part of the mountain rises 1,658 ft. above the crater. The portion that was blown away must therefore have had an altitude of 2,198 ft. above the crater. With this went also 540 ft. from the top of the southwestern wall that remains.

Ten full-page plates illustrate the *Journal*.

THE FOREIGN TRADE OF CHINA.—The *Returns of Trade and Trade Reports for the Year 1888*, published by order of the Inspector-General of Customs, show a stationary condition for the years 1876–1886, followed by a marked increase both in export and import values for 1887 and 1888. For the eleven years first named the average total was 150,131,120 *Haikwan* Taels (1 Hk. Tl. = \$1.15). For 1887 the amount was 188,123,877, and for 1888 217,183,960 Hk. Tls. The Customs Revenue rose likewise from an average of 13,607,271 Hk. Tls. for the eleven years to 20,541,399 for 1887, and 23,167,892 for 1888.

EXPLORATION OF THE OWEN STANLEY RANGE.—The *Scottish Geographical Magazine* for August publishes a telegram received by the Colonial Office from the Governor of Queensland, in these words: “MacGregor returned Port Moresby after most successful exploration crest Owen Stanley Range; named Mount Victoria, 13,121 ft.; new mountain north of Owen Stanley, 12,500, named Albert Edward; many other peaks of little lower elevation discovered and named.”



Details of this achievement, promised by the Colonial Office, have not yet been received.

Mt. Owen Stanley is supposed to be the loftiest mountain of the Pacific, S. of the Equator, with the possible exception of Kinabalu, in Borneo.

Previous attempts at climbing Owen Stanley, though made by competent explorers, resulted in failure.

Sir William MacGregor was probably better supported and supplied than his predecessors.

TAPPENBECK AND DOULS.—These two courageous explorers have fallen almost simultaneously in Africa, while their work was hardly begun.

Lieut. Tappenbeck and his associate, Lieut. Kund, in their march overland through the Congo Valley, ran great risks from the hostility of the natives, but made their way safely, with mingled tact and firmness, to the Ikatta River. The story of their adventures is full of interest and excitement. They afterwards went to the Kamerun Colony and it was there that Lieut. Tappenbeck sickened with the fever, and died, late in July.

Camille Douls, who has perished by assassination in the Western Sahara, was but twenty-five years of age. He began his career as an explorer four years ago by landing on the coast of the Sahara in the guise of a Mussulman, and travelling in that character through the western part of the desert. His extraordinary command of Arabic saved him on more than one occasion, but there is little reason to doubt that he had in some way roused the suspicion of his fanatical guides in his attempt to reach Timbuktu. His last letter, written

from Tangier before starting, showed that he knew the dangers that lay before him.

*Rapport présenté au Ministère de l'Agriculture, du Commerce et des Travaux Publics et à la Société de Géographie de Rio de Janeiro sur le Déplacement et le Transport du Météorite de Bendegó, de l'Intérieur de la Province de Bahia au Musée National par José Carlos de Carvalho Ancien-Officier de la Marine de Guerre Nationale. Rio de Janeiro, 1888. (from the Author.)*

The meteorite of Bendegó was found in 1784, in the neighborhood of the little stream from which it takes its name. (Bendegó is the Portuguese form.)

An attempt was made the following year to remove the mass, but the cart on which it had been placed broke down and the stone was deposited in the stream. There it remained for a number of years, till it was visited in 1810 by a man of science, A. F. Mornay, who found on examination that it was composed of iron. He broke off with great difficulty a piece of several pounds' weight and sent it with a letter to Dr. Wollaston, who read the letter before the Royal Society in 1816, with a note of his own, giving an analysis of the fragment. It was found to be composed of: Iron 95.1 per cent.; Nickel 3.9 per cent.; and 1 per cent. of other substances.

Mornay gave the following measurements of the mass: Length, 7 ft.; width, 4 ft.; thickness, 2 ft. He estimated the contents at 28 cubic feet, and the weight at 14,000 pounds.

In 1887 the Geographical Society of Rio de Janeiro undertook to transport the meteorite to the National

Museum. The difficulties of the task were considerable. The unwieldy mass was to be carried a distance of 70 miles, over long slopes of 18 to 20 degrees and down inclines of 30 degrees in the Serra d'Acaru, and across a number of streams, some with very steep banks, to the railway station at Jacuricy. An iron waggon, of about a ton's weight, was built for the occasion, and the work was successfully accomplished, after many interruptions caused by bad weather and the breaking down of the waggon, in 126 days.

The Report, which is a large quarto in French and Portuguese, is illustrated by a photograph of the meteorite and a folding plan of the route travelled.

*Esboço Geographico da Provincia do Paraná, por Sebastião Paraná, Rio de Janeiro, 1889. (from the Author.)*

The province of Paraná is in southern Brazil, between São Paulo on the north and Santa Catharina on the south. It covers about 170,000 square miles and its limits are well defined by rivers on the north, west and south, and by the ocean on the southeast.

It is one of the four provinces towards which European immigration is most strongly attracted by the fertility of the soil and the salubrity of the climate.

Mr. Sebastião Paraná gives in his little book a brief and well-arranged description of the country, its mountains and rivers, its climate, vegetable and mineral products, and an account of its cities and towns.

The soil produces sugar, cotton, tobacco, coffee, rice, tea, and in the highlands wheat and other grains. The tea culture is so general that many families raise the

leaf for their own use, and the Government has had it in view to extend the culture by establishing a colony of Chinese ; but Mr. Paraná rather approves the policy of the United States, "the model country on the question of immigration," in rejecting the Asiatics. He thinks at the same time that perhaps the Chinese might be accepted in Brazil "as a simple automaton for the work which is peculiar to him." A closer acquaintance with the automaton may show that he is not so simple as he looks.

Mr. Paraná's *Esboço* is his first essay in geographical work, and it is creditable to him.

*Travels in the Atlas and Southern Morocco. A Narrative of Exploration. By Joseph Thomson, F. R. G. S. New York, 1889.*

Mr. Thomson says in his preface that he has only recorded "something of what we saw and experienced in the parts in which we travelled."

This frank confession disarms criticism, though the reader may fairly enough object to the size of the book and the iteration of some experiences.

There is a little too much of Shalum the Jew, and the long palavers with the men in power are common incidents of travel in Mohammedan countries.

The suspicious fanaticism of the people defeated more than one of Mr. Thomson's purposes. He was able to penetrate but a little way into the Atlas Mountains, and the altitudes of peaks visited or seen are estimated rather than measured.

He gives to the Tizi-Likumpt, which he climbed, a height of 13,150 feet, and to the Tizi-n-Tamjurt, which

he takes to be the loftiest point of the Atlas, an elevation of not less than 15,000 feet.

It was in the central Atlas, on the Wad Agandice, that he discovered the most magnificent gorge he had ever seen, "such as may be found in America;" or, if Mr. Thomson would go there, at Les Causses, in France. "Imagine," he says, "a great yawning crack running right across a range of mountains. Picture yourselves at the bottom. On either side you look skyward over 5,000 feet of beetling cliffs and precipices, broken into by areas of extremely steep slopes and deep-cut crevices, and capped by fantastic rocky peaks and turret-like masses."

The city of Morocco disappointed the traveller. It covers a quadrangular space of about eight miles on a side, and the general dead level of the reddish, flat-roofed houses is broken only by the square minarets of the mosques, ten in number, which rise to the height of from 60 to 100 feet. Of these minarets one, the Kutubia, built of stone and 270 feet high, dominates the city and the plain around it for thirty miles, and is the most striking monument in all Southern Morocco, resembling and not unworthy to be compared with the Giralda of Seville.

The Moors were found to be dignified and courteous, though fanatical, cleanly in their habits, but false-hearted and morally corrupt beyond all other men; a sad distinction conferred upon them possibly by Mr. Thomson's perfervid genius, or his haste.

In the mountains and south of the Atlas the Jews are greatly oppressed, but in the towns and in Morocco proper they are the oppressors. They are largely gov-

erned by their own laws, administered by their own Sheiks, and with their own code of punishment. They are not liable to conscription, nor are they taxed for the support of the Kaid and the Sultan ; and their lives and property are comparatively safe. As money-lenders they divide with the Government, which plunders the people, the whole wealth of the country ; and when they suffer an injustice their cause is taken up by the representatives of the European Powers. Their way of life and their streets in the *Mellah*, or Jewish quarter, are foul in the superlative degree.

Excepting the Englishmen, whose hands are clean, the foreign agents in Morocco, says Mr. Thomson, drag the honor of the various nations in the mud by their traffic in the sale of "protections." Of all the sinners the Americans are the most shameless. They have no trade, no genuine subjects, no real or imaginary interest to look after, yet there is an American Minister at Tangier, besides Vice-Consuls, mostly Jews, in the chief coast towns. "Nay, more ;" he adds, "America does not hesitate to make a naval demonstration to compel the payment of bills run up in the Jewish fashion—a few paltry hundreds of dollars becoming in a year or two thousands upon thousands."

The American Minister at Tangier is a consul, and it may be true that he and the vice-consuls (if these exist) are something of a luxury. Nations, like peacocks, love to display themselves more or less shamelessly, but it is yet a comfort to know that virtue will not die out of the world so long as the English survive.

Even they, however, may be tempted too far, and it

would be cause for lasting and vain regret if the example of the American demonstration against Morocco led England, hitherto without reproach in such matters, to enforce at the cannon's mouth the payment of disreputable claims.

The book has many excellent illustrations, fine maps and a plan of the city of Morocco.

*The History of a Slave. By H. H. Johnston, F. R. G. S., F. Z. S. London, 1889.*

In this book Mr. Johnston attempts "to give a realistic sketch of life in the Western Sudan." He has endeavored, he says, to make his landscapes, architecture, implements, costumes, and studies of human types, as locally accurate as possible.

None but those who are acquainted with the Sudan can say how far this endeavor has been successful, but it is not too much to affirm that the book, or booklet, as Mr. Johnston calls it without a shudder, is a masterpiece. The story is told without effort and without exaggeration, and for naturalness Abu-l-Guwah belongs to the family of Robinson Crusoe.

*The First Ascent of the Kasai: Being Some Records of Service Under the Lone Star. By Charles Somerville Latrobe Bateman, with Illustrations and Maps. New York, 1889.*

Mr. Bateman was second in command of the expedition which escorted Calemba, the King of the Baluba, back to his native country. Calemba had descended the Kasai with Lieut. Wissmann, to see the Congo and the European establishments.

The author does not claim to have written a book of discovery.

He has wished to give a representation of places and things, climate, scenery and people ; and he has been careful to describe not merely the outward appearance of things, but the impression produced upon himself by the circumstances which occurred and the scenery through which he passed. He has endeavored to expose the covert slave-trade carried on by the Angolese subjects of Portugal, and this is well ; but is there no slave trade open, or covert, in other European colonies, or African States controlled by Europeans ? Mr. Bateman does not reason very soundly on the slavery question. He says : “ It is but right that I should draw attention to the difference existing between slave-owning and slave-dealing. So far as I can see, slavery must exist in the regions watered by the Congo and its tributaries for a very long period to come ; its suppression, were it possible, would lead to anarchy and misery without conceivable limits. But slave-dealing is quite another matter.” . . .

If this means anything, it means that you may have slaves, but you must not buy them. There are, perhaps, but three other ways of acquiring this desirable property ; a man may inherit slaves, or he may raise slaves, or he may go out and hunt them. These, then, are laudable methods, but to buy the property is sinful, because there must be a dealer to sell it.

Mr. Bateman saw nothing that interested him or struck him as being specially hopeful in the composition or conduct of the Baptist and other Reformed Missions in the State.



This negative condemnation is itself reduced to nothing by the mention of one Baptist missionary who was devoted to his work to the point of helping Mr. Bateman through an illness.

The natives were generally friendly and the voyagers stopped long enough at various points to devote some study to the tribes and their ways of life. Among the many illustrations from Mr. Bateman's drawings there are types of the Basongo-Meno, the Bakété, the Zingas and others, with representations of their weapons and implements ; and among the portraits is one of Senhora Caxavalla, a genuine African beauty. Fine colored views give a lively idea of the scenery.

A permanent record of the trip was made by the establishment of the Luebo Station at the confluence of the Luebo and Lulua rivers.

*The Geography of the Sea. By Lieut. George L. Dyer, U. S. N. In Charge U. S. Hydrographic Office, Navy Department. (from the Author.)*

Lieut. Dyer, as one of the Vice-Presidents of the National Geographic Society, of Washington, is charged with the duty of making an Annual Report on matters that fairly come under the head of the "Geography of the Sea," according to the classification adopted by the Society. The present pamphlet is his first Report, and he has thought it advisable to give a "brief outline of the progress made in our knowledge of the sea since 1749, when Ellis reported depths of 650 and 891 fathoms off the northwest coast of Africa." In fact it was impossible for Lieut. Dyer, considering the restricted space at his command, to do more than hint at the

results accomplished in oceanography by the untiring industry of the scientific men of every nation. It is a service done to call public attention to these results, and the somewhat extended notice of the work done by the U. S. Coast and Geodetic Survey Steamer *Blake* will undoubtedly attract many, for whom the sea as the common highway of mankind has but little interest.

What is known as to the temperature, the chemical composition, and the relative depths of the ocean is set forth in three or four pages.

*Le Projezioni Cordiformi Nella Cartografia per M. Fiorini. Roma, 1889. (from the Author.)*

This pamphlet, reprinted from the *Bollettino* of the Italian Geographical Society for July, 1889, is intended as a supplement to previous writings of Prof. Fiorini's on the subject of the cordiform, or heart-shaped projections, so much in favor with the cartographers of the XVIth Century. The invention or, at least, the suggestion of this form is ascribed by the writer to Bernardus Sylvanus, of Eboli, from whose maps the idea was taken and improved by Werner, who was followed by others, as Orontius Finæus, Vadianus and Mercator. The last brought out in 1538 his double-heart-shaped map of the world, the *Orbis Imago*, of which the only known copy is now in the library of the American Geographical Society. Prof. Fiorini gives the history of this unique map, discovered by the late James Carson Brevoort in a copy of the *Tabulæ Geographicæ Cl. Ptolemaei*, published by Mercator in 1578. Reproductions of the *Orbis Imago*, with modifications of the inscriptions and the omission of the dedication, were published

at Rome, by Lafreri and by Salamanca, "two real plagiarists," says Prof. Fiorini, who simply appropriated the work of Mercator.

The most remarkable of all the cordiform maps still in existence, is the Turkish Mappamundi, described by D'Avezac. This is engraved on six (not four) wooden tablets, found in 1795, in the Archives of the Council of Ten, at Venice, and now preserved in the Library of St. Mark. When discovered, the tablets were in good condition, and twenty-four copies of the map were worked off from them; but they are now past service. The date of the work is 966-967 of the Hegira (1558-1560, A.D.).

The maker of the map was Hadji Ahmed, a native of Tunis, who studied mathematics at Fez, then a centre of Mohammedan learning. He was captured by the Christians and sold to a gentleman, who allowed him to pursue his studies.

His work is evidently modelled on that of Finæus, but it is no servile imitation. Hadji Ahmed rearranged the intervals of the parallels and the meridians, and introduced, as Prof. Fiorini points out, a number of improvements. He added many names, and corrected the outlines of the coasts of the New World, on both oceans; and he represented the northern regions with a nearer approach to exactness than Finæus.

There are four copies of the Turkish map: one in the Library of St. Mark, another in the Seminario of Sta. Maria della Salute, a third in Prince Metternich's library at Vienna, and the fourth in the Correr Museum, at Venice. This last was brought to light during the present year in a volume, containing a number of miscellaneous wood engravings.

The Library of St. Mark possessed, up to the year 1865, a second copy of this precious work, bound in a volume for the use of students ; but it has disappeared.

The copy just found in the Correr Museum is certainly not the lost one, for the volume of engravings was bound by Lazzari, who died in 1864.

The cordiform projection did not stand the test of time. The first Mappamundi in this style was published in 1531, the last in 1566. According to Prof. Fiorini cartographers were led to abandon this shape on account of the great linear and angular alterations unavoidable in it.

*Note.*—In an appendix, on p. 676 of the *Bollettino* for August, received just before going to press, Prof. Fiorini reports the discovery of the missing Turkish map at the Library of St. Mark. Cav. Castellani, the librarian, writes on the 10th of August :

“After the receipt of your last letter we continued the search for the second copy of the Turkish map ; and yesterday it was found in a bookcase under the systematic catalogue, where it must have been put by my predecessor. . . . With the map was Assemani’s *Dichiarazione*.”

There are, therefore, five copies of the map in existence.

*Annuario dell’ Istituto Cartografico Italiano, fondato il 1 Gennaio, 1884. Anno Terzo e Quarto. Roma, 1889. (from the Institute.)*

The Italian Cartographical Institute is a private enterprise, supported by its own efforts and well supported, if the work of less than five years is judged on its merits. In that time it has published an original map of Assab and the neighboring country, a map of the Egyptian Sudan with the Red Sea Coasts as far as Assab, a map of the Alps near Susa, a map of the Italian possessions and protectorates, a map of the Italian railways, and an Elementary Atlas, besides the *Annuario*, which contains original articles on geograph-

ical subjects. The contents of the present very handsome volume are: Introduction, by G. Dalla Vedova; Cartographic Curiosities, by M. Fiorini; The Question of the Name of America, by F. Porena; The Difficulty of Determining Exactly a Difference of Longitude in Close Proximity to the Poles, by E. Millosevich; A Method of Giving Greater Exactitude to Measurements of Distances on Topographical Maps, by G. Govi; The History of Geography in Italy, With Particular Reference to the Catholic Missions and the Institute of "Propaganda Fide," by G. Pennesi; Brief Notes on the Geographical Institute of Justus Perthes, at Gotha, by G. E. Fritzsche; New Orometrical Formulas for Determining the Mean Elevation of a Crest and its Mass, by G. Ricchieri; Work of the Italian Cartographical Institute in Recent Years, by G. E. Fritzsche. The last two papers are illustrated by folding maps.

*La Letteratura degl' Indigeni Americani, per Ferdinando Borsari, Napoli, 1888. Una Pagina di Storia Argentina per F. Borsari, Napoli, 1888. (from the Author.)*

The first of these two publications is a lucid sketch of what is known concerning the native American literature, which Prof. Borsari takes to be worthy of serious attention on account of its human interest. His essay is marked throughout by a soberness of tone and a critical good sense, too often wanting in the notices of American literature, as in those of American archæology. He closes with a suggestion for the formation of an Italian Society of Americanists, and it cannot be

doubted that the scholars of the Peninsula will act on the suggestion.

The second publication gives in a few pages the story of the conquest of the Pampa, from the day in 1855 when Col. Bartolomé Mitre (inspired, possibly, by the example of Sir Charles Napier, setting out the year before to take Cronstadt "with sharpened cutlasses"), declared that he would protect the tail of the last cow in the province, to the scientific and vigorous campaigns of Gen. Julio A. Roca, who put an end to the Indian question in the Argentine Republic. This page of history teaching by example has its special application to the problem now before Italy in Abyssinia, and Prof. Borsari has evidently not looked beyond this; but Americans, remembering their own half-hearted and spasmodic dealings with the Indians of the United States, may see themselves as others see them in one sentence that describes the Argentine policy before the coming of Gen. Roca: "One day military expeditions were sent against the Indians, and the next money and gifts of every kind were lavished upon them to buy their good behaviour."

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